REMR Material Data Sheet CM-PC-1.32

CONCRETE PATCHING MATERIALS: RESURF SF POLYMER CONCRETE

1. NAME

RESURF SF Polymer Concrete

2. MANUFACTURER

Polymer Concrete, Inc.
Route 1, Box 510
Camden, AL 36726
Telephone: 205-682-4296

3. DESCRIPTION

RESURF SF Polymer Concrete is a pre-packaged polymer concrete that consists of modified polyester resin and a blended aggregate mixture. The system is supplied as a three-component system, the polyester resin, catalyst, and aggregate. The polyester resin is supplied in a 55-gal drum. A faucet for the drum and measuring pails for the resin are supplied for each drum. The catalyst is supplied in a 1-gal plastic bottle along with a beaker for measuring the catalyst. The aggregate is supplied in 5-gal plastic pails.

4. USES

RESURF SF Polymer Concrete is produced for the repair of portland cement concrete (PCC). The material has been used for the repair of shallow and full depth spalls in highways, bridges, and airports. The material has also been used for restoring bridge and pavement joints.

5. MANUFACTURER'S TECHNICAL DATA

Property	Test Method	Results
Compressive strength, psi	ASTM C 39	
2 hr		1,500
24 hr		8,000
7 days		10,000
Bond strength to concrete, psi	ASTM C 882	>3,500
Flexural strength, psi	ASTM C 580	2,500
Linear shrinkage, %	ASTM C 531	0.04
Coefficient of thermal expansion, in./in./F°	ASTM C 513	11×10^{-6}
Tensile strength, psi	ASTM C 307	1,100
Density, lb/ft^3		136
Working time, min		10 to 15

6. MANUFACTURER'S GUIDANCE FOR APPLICATION

Mixing instructions: The procedure for mixing and placing RESURF SF is given on the back of each pail of

aggregate. The mixing instructions are as given:

a. Measure 7.5 lb of resin per 1/2 cu ft of aggregate (pails supplied).

b. Pour resin into mixer; a concrete or mortar mixer can be used for mixing. A wheelbarrow and hoe can be used for mixing small volumes.

c. Add catalyst (measuring beaker supplied) to resin at a 1- to 4-percent level depending on the ambient temperature, for approximately 15-min working time. The different levels or percentages are listed below:

Hot weather--1 percent--33 ml of catalyst per 7.5 lb of resin

Warm weather--2 percent--65 ml of catalyst per 7.5 lb of resin

Cool weather--3 percent--100 ml of catalyst per 7.5 lb of resin

Cold weather--4 percent--135 ml of catalyst per 7.5 lb of resin

Mix well for 30 sec.

d. Add aggregate to catalyzed resin and mix until wetted (2 to 3 min).

Preparation and placement: For large and deep repairs, RESURF SF can be extended with a 3/8- or 1/2-in. aggregate. The amount of additional aggregate should not exceed 50 percent by volume of the aggregate blend previously added.

When repairing a spalled area, the area may be prepared by saw cutting around the perimeter of the spalled area and removing the unsound concrete within the saw cut by chipping. The spalled area can also be repaired using only chipping. If saw cutting is not used, featheredging should be avoided. The concrete should be sound and dry before placement of the polymer concrete. The area to be repaired should be coated with the catalyzed resin before placement of the polymer concrete, avoiding puddling of the prime coat. When maintaining joint openings, closed cell polyethylene foam, such as Ethafoam or Ceremar, has been found to work well. The resin will not bond or dissolve these materials. Tamp to settle deep repairs; rectangular trowels or short pieces of 2 by 4 work well.

The supplier of the material reported that the resin can be formulated to harden in extremely cold weather with ambient temperatures as low as 0°F. On extremely cold days (freezing or below), the area prepared for patching should be warmed with a propane torch before priming.

Solvent usage and cleanup work can be reduced if the mixer is emptied after each batch. The mixer and hand tools can be scraped before polymer concrete gels or is in a "cheesy" state. Soaking in methylene chloride overnight or chipping the next morning will remove cured material. Acetone, methyl ethyl ketone, and 1,1,1 trichloromethane are also good cleanup solvents. Follow the manufacturer's recommended procedures or cautions when using solvents.

7. CORPS OF ENGINEERS' EVALUATION

Properties	Test Method	Results
Compressive strength, psi	ASTM C 39	
6 hr		2,830
24 hr		7,280
7 days		9,640
Flexural strength, psi	ASTM C 78	2,510
Bond strength to dry concrete, psi	ASTM C 882	>3,800

Properties	Test Method	Results
Bond strength to damp concrete, psi	ASTM C 882	2,400
Bond strength of RESURF SF to hardened RESURF SF, psi	ASTM C 882	4,900
Linear shrinkage during cure, %	ASTM D 2566	0.01
Thermal compatibility with concrete	ASTM C 884	Passes test
Abrasion resistance, % loss by mass, 72-hr testing	CRD-C-63	0.20

8. ENVIRONMENTAL CONSIDERATIONS

Reasonable caution should guide the preparation, repair, and cleanup phases of activities involving potentially hazardous and toxic chemical substances. Manufacturer's recommendations to protect occupational health and environmental quality should be carefully followed. Material safety data sheets must be obtained from the manufacturers of such materials. In cases where the effects of a chemical substance on occupational health or environmental quality are unknown, chemical substances should be treated as potentially hazardous toxic materials.

9. MANUFACTURER'S SAFETY RECOMMENDATIONS

Avoid getting catalyst or resin on eyes and skin. Contact with eyes can cause considerable irritation. Flush eyes with water and wash skin with soap and water. Always have water available for irrigation. Wear rubber gloves and a face shield when mixing. Avoid breathing dust (fine silica sand) when loading mixer.

10. AVAILABILITY & COST

Availability: The material is available through Polymer Concrete, Inc.

Cost: The cost for 25 cu ft of the polymer concrete (1 drum of resin and 50 pails of aggregate) is $1,400 (price FOB, 1990). Contact Polymer Concrete, Inc., for small orders.